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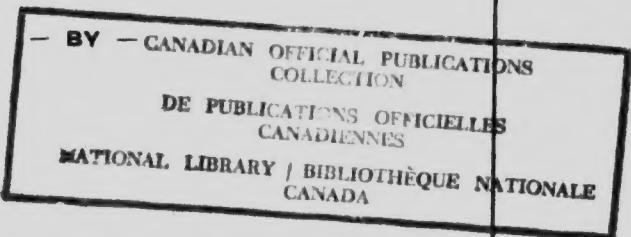
**DEPARTMENT OF THE INTERIOR,
CANADA**

FORESTRY BRANCH

**Hon. FRANK OLIVER, Minister of the Interior
W. W. CORY, Deputy Minister of the Interior
R. H. CAMPBELL, Superintendent of Forestry**

BULLETIN No. 3

**THE DOMINION
FOREST RESERVES**



**A. KNECHTEL,
INSPECTOR DOMINION FOREST RESERVES.**

100-341763

THE DOMINION FOREST RESERVES.

INTRODUCTORY.

It would almost seem as if the white race had begun wrong on this continent. Needing cleared land for agriculture we started in the woods, and now when we need woods we start on the cleared land. The arrangement was not an economic one. The prairie should have been located near the Atlantic and the woodland in the Northwest. Arranged as it was, with the forest on the land that was close to the market for its products, forest destruction was at first a necessity, and later became a habit. Fire, the good servant in clearing the land, ran rampant carrying forest devastation far beyond the necessities of the people.

The earliest settlers, coming from Europe were used to forest conservation. They had practised it in the countries from which they came. Forest destruction was to them a new thing; but the forests were so vast that they thought there could never be a scarcity of wood, and they reasoned that the more the forest was destroyed, the more the agricultural interests of the country would be advanced. But the modern settler sees the forest in a different light, especially so in the great Northwest where on the wide prairie wood is a luxury. To him forest conservation is the necessity, not forest destruction. He has no delight in the devastation of the woods by fire, and he hails with hope legislation and management tending to improve the condition of the forest. He sees clearly that his comfort and his agricultural interests are closely dependent upon a plentiful supply of wood.

The country is so vast and the demand for wood so great, it is a tremendous problem to so manage the forests that this demand may be met continuously. Hope seems to lie in the creation of forest reserves, and the policy of setting aside land to be used as forest reserves is now pretty well established by the Dominion Government.

The Dominion Forest Reserves are intended to preserve and produce a perpetual supply of timber for the people of the

prairie, the homesteaders' needs being considered of first importance. They are not intended to furnish wood for the lumber trade. Hence the policy of the Department is favorable to small mills rather than to large ones which need large tracts of forest and manufacture lumber beyond the needs of the settlers. To furnish wood is primarily the purpose of Parliament in the creation of the reserves. To be sure, our legislators are not unmindful of other blessings of the forest. They are well aware that forests feed springs, prevent floods, hinder erosion, shelter from storms, give health and recreation, protect game and fish, and give the country aesthetic features. However, the Dominion Forest Reserve policy has for its motto, "Seek ye first the production of wood and its right use and all these other things will be added unto it."

LOCATION AND AREA.

The Dominion Forest Reserves all lie in the northwestern provinces. They are twenty-six in number, including the parks whose timber is managed in precisely the same way as that of the timber reserves proper. The number twenty-six does not include the eastern slope of the Rockies, however, although it also is under management similar to that of the forest reserves. Manitoba has six reserves, namely:

| | | | |
|--------------------------|------------|-------|------------|
| Riding Mountain Reserve, | containing | 1535 | sq. miles. |
| Duck Mountain | " | 1251 | " " |
| Porcupine No. 1 | " | 322 | " " |
| Lake Manitoba West | " | 248 | " " |
| Spruce Woods | " | 110 | " " |
| Turtle Mountain | " | 109½ | " " |
| Total..... | | 3575½ | " " |

Saskatchewan has four, namely:

| | | | |
|--------------------------|------------|-----|------------|
| Porcupine No. 2 Reserve, | containing | 360 | sq. miles. |
| Moose Mountain | " | 163 | " " |
| The Pines | " | 145 | " " |
| Beaver Hills | " | 72 | " " |
| Total..... | | 740 | " " |

Alberta has six, namely:

| | | | |
|--------------------------|------------|------|------------|
| Jasper Park Reserve, | containing | 5000 | sq. miles. |
| Rocky Mountain Park Res. | " | 4500 | " " |
| Cooking Lake Reserve, | " | 114 | " " |
| Kootenay Lakes, | " | 54 | " " |
| Cypress Hills | " | 18 | " " |
| Elk Island | " | 16 | " " |
| Total | | 9702 | " " |

British Columbia has ten, namely:

| | | |
|-------------------------------|------|------------|
| Yoho Park Reserve, containing | 828½ | sq. miles. |
| Glacier Park | 576 | " " |
| Hat Creek | 208 | " " |
| Long Lake | 190 | " " |
| Tranquille | 149 | " " |
| Niskonlith | 124½ | " " |
| Monte Hills | 106 | " " |
| Donald | 72 | " " |
| Larch Hills | 25 | " " |
| Martin Mountain | 18 | " " |
| Total | 2295 | " " |

Summarizing:

| | |
|-------------------------------|------------------|
| Manitoba has 3,575½ sq. miles | 2,288,160 acres. |
| Saskatchewan 740 " " | 473,600 " |
| Alberta " 9,702 " " | 6,209,280 " |
| B. C. " 2,295 " " | 1,467,800 " |
| Grand Total 16312½ | 10,438,840 " |

DATES OF FORMATION.

The Dominion Government awoke to the necessity of forming forest reserves in 1887, and has been constantly moving forward in that direction, thus conserving the timber, ever since that date, as appears from the following table which gives the dates when the reserves were set aside.

1887, June 23.—Rocky Mountain Park Reserve, by Act of Parliament.

1888, Oct. 11.—Glacier Park Reserve, by Order in Council.

1894, Dec. 29.—Moose Mountain Reserve, by Departmental Order.

1895, May 30.—The Kootenay Lakes Reserve, by Order in Council.

1895, July 13.—Riding Mountain Reserve, by Departmental Order.

1895, July 13.—Lake Manitoba West Reserve, by Departmental Order.

1895, July 13.—Spruce Woods Reserve, by Departmental Order.

1895, July 13.—Turtle Mountain Reserve, by Departmental Order.

1899, June 5.—Cooking Lake Reserve, by Departmental Order.

1901, Dec. 14.—Yoho Park Reserve, by Order in Council.

1901, Aug. 29.—Beaver Hills Reserve, by Departmental Order.

1902, Nov. 3.—Long Lake Reserve, by Departmental Order.

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- 1902, Nov. 3.—Rocky Mountain Reserve, extended 152 townships by Act of Parliament.
1903, Nov. 26.—Glacier Park Reserve extended 16 townships by Order in Council.
1905, Nov. 14.—The Pines Reserve, by Departmental Order.
1906, July 13.—Duck Mt. Reserve, by Act of Parliament.
1906, July 13.—Porcupine No. 1" " "
1906, July 13.—Porcupine No. 2" " "
1906, July 13.—Cypress Hills " " "
1906, July 13.—Monte Hills " " "
1906, July 13.—Martin Mountain" " "
1906, July 13.—Niskonlith " " "
1906, July 13.—Tranquille " " "
1906, July 13.—Hat Creek " " "
1906, July 13.—Donald " " "
1906, July 13.—Larch Hills " " "
1906, July 13.—Elk Island " " by Order in Council.
1907, Sept. 14.—Jasper Park. " " " "
Sept. 17.—Yoho Park, reduced 105 sq. miles, by Order in Council.

The work of making forest reserves is still progressing, and will need to progress in Canada for many years. This year the region around the Waterton Lakes in southwestern Alberta was examined for this purpose. The forester who examined it recommended that 195 square miles be set aside. Also, territories adjacent to certain reserves have been examined with view to ascertaining their suitability to be added. Recommendations have been made that 130 square miles be added to the Spruce Woods Reserve in Manitoba, 238½ square miles to the Pines Reserve in Saskatchewan, 45 square miles to the Beaver Hills Reserve in Saskatchewan and 192 square miles to the Cypress Hi's Reserve in Alberta.

It is the policy of the Department in throwing open territories for settlement, to put into forest reserves all land that is unsuited to agriculture or grazing, and in making these examinations the foresters have kept this policy in mind.

GRAZING ON FOREST RESERVES.

It is not the policy of the Department, however, to exclude from the reserves all land suitable for grazing. In fact, they already include large grazing areas, and, if the recommendations made this year be sustained, such areas will be added to the Cypress Hills and Beaver Hills. These areas are among timber, and so we include them, rather than to exclude the timber. Nor is it the policy of the Department to prevent grazing on these areas. For several reasons it is desirable that they should be grazed. The forest reserves are for the use of

the people; then why should good grass be allowed to go to waste if it can be utilized? The grazing may be desirable also as a protection to the woods. In some places the ground is covered with a dense growth of long grass and peavine. This, when dry, offers much fuel for fire; and when the fire once gets into it, it is almost impossible to check the flames. Cattle on the prairie have much the same habit as the buffalo. In going to water they follow one another and make paths which they follow day after day. These paths are fire lines where the fire may be checked, small to be sure, but there are many of them, and they give lines from which to back-fire.

Perhaps it will be objected that grazing prohibits the reproduction of timber. It seems to me, however, that the interference with reproduction from this cause is much overestimated. I know in the West many fields grazed constantly that have come into timber. There is danger from overgrazing, but from judicious grazing there is much less danger than from long grass and peavine.

PROTECTION AGAINST FIRE.

The problem of protecting the forest reserves against fire is the most difficult one we have. The fire problem is difficult even in the eastern provinces; but the conditions for fighting fire here are very favorable as compared with those prevailing in Manitoba, Saskatchewan, Alberta, and eastern British Columbia. Compare, for instance, the number of rainy days for the summer months at Calgary, Alberta; Qu'Appelle, Saskatchewan; Winnipeg, Manitoba; and Toronto, Ontario. In our comparison, however, we must not only consider the number of rainy days but also the quantity of rain falling on those days; because, although a day may be considered rainy, there may not be precipitation enough to count much towards putting out a forest fire. The following table is a comparison for the four places mentioned showing the average number of rainy days in each of the summer months, and the average quantity of rain falling in those months. It is compiled from statistics furnished by the Meteorological Service published in a volume entitled "Rain and Snow-Fall of Canada."

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TABLE OF RAINY DAYS.
(AVERAGE 1883 TO 1902—20 YEARS.)

| | Jan. | Feb. | Mar. | April | May | June | July | Aug. | Sept. | Oct. | Nov. | Dec. | Totals. |
|----------------------|------|------|------|-------|-------|-------|-------|-------|-------|-------|-------|------|---------|
| Calgary, Alta..... | 0.20 | 0.06 | 0.33 | 2.93 | 9.40 | 12.93 | 12.00 | 8.66 | 6.93 | 2.79 | 2.66 | 0.26 | 59.15 |
| Qu'Appelle, Sask.... | 0.25 | 0.30 | 0.40 | 4.00 | 8.80 | 12.65 | 11.90 | 8.35 | 8.15 | 4.70 | 0.90 | 0.30 | 60.70 |
| Winnipeg, Man..... | 0.45 | 0.25 | 1.20 | 6.80 | 9.15 | 13.40 | 12.25 | 12.25 | 11.05 | 8.45 | 1.60 | 0.07 | 76.92 |
| Toronto, Ont..... | 5.30 | 5.75 | 6.70 | 9.30 | 13.30 | 11.35 | 11.95 | 10.35 | 11.05 | 13.20 | 11.15 | 7.45 | 116.85 |

TABLE OF RAINFALL IN INCHES.
(AVERAGE 1883 TO 1907—25 YEARS.)

| | Jan. | Feb. | Mar. | April | May | June | July | Aug. | Sept. | Oct. | Nov. | Dec. | Totals. |
|----------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|---------|
| Calgary, Alta..... | 0.013 | 0.016 | 0.024 | 0.262 | 2.010 | 3.060 | 2.630 | 2.490 | 0.991 | 0.191 | 0.004 | 0.005 | 11.696 |
| Qu'Appelle, Sask.... | 0.002 | 0.085 | 0.036 | 0.356 | 1.785 | 3.580 | 2.594 | 1.750 | 1.446 | 0.463 | 0.400 | 0.072 | 13.336 |
| Winnipeg, Man.... | 0.005 | 0.003 | 0.160 | 1.142 | 1.858 | 3.319 | 3.003 | 2.209 | 1.253 | 1.290 | 0.728 | 0.013 | 14.983 |
| Toronto, Ont..... | 1.128 | 0.954 | 1.360 | 1.467 | 2.754 | 2.844 | 2.856 | 2.624 | 2.855 | 2.532 | 2.104 | 1.563 | 25.041 |

It would appear from these tables that Toronto is at a slight disadvantage in the month of June. But of all the summer months, June, July and August offer the least danger to the forest. In these months the grass is green, the leaves are out on the shrubs and trees, the sap is in the bark, and the ground is moist from the shade of the trees. The chief danger periods are in the spring before June, and in the fall after September, when the woods are dry. The Ontario fire law is constructed upon the idea that the most dangerous period is from May 1st, to October 1st. My own observations in Ontario have led me to doubt the wisdom of that law in this particular.

The eastern provinces have a great advantage also in regard to the wind. The average hourly velocity of the wind at Winnipeg for the eight summer months of 1905, as stated by the Meteorological Service, was 14.87 miles per hour, while at Toronto it was only 7.36 miles per hour; just twice as great at Winnipeg as at Toronto. The people of the East were fortunate in that respect last summer. Had the wind here been as high as in the West, quite likely there would have been twice the quantity of timber destroyed. Then, in the East the winds are moist; there is no dry chinook.

Again, in respect to population the East has the advantage. When a forest fire starts in Ontario or Quebec, you can just

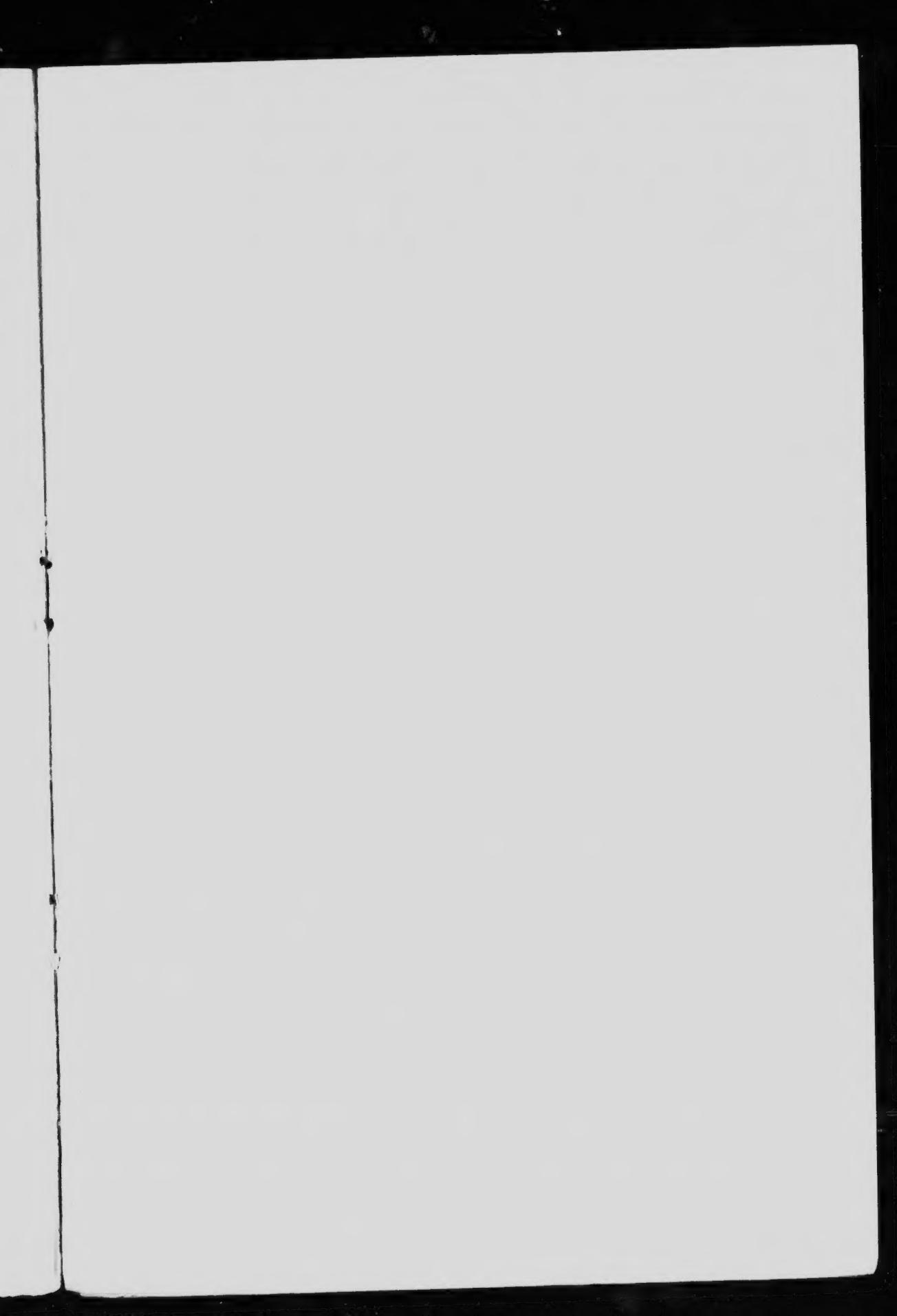
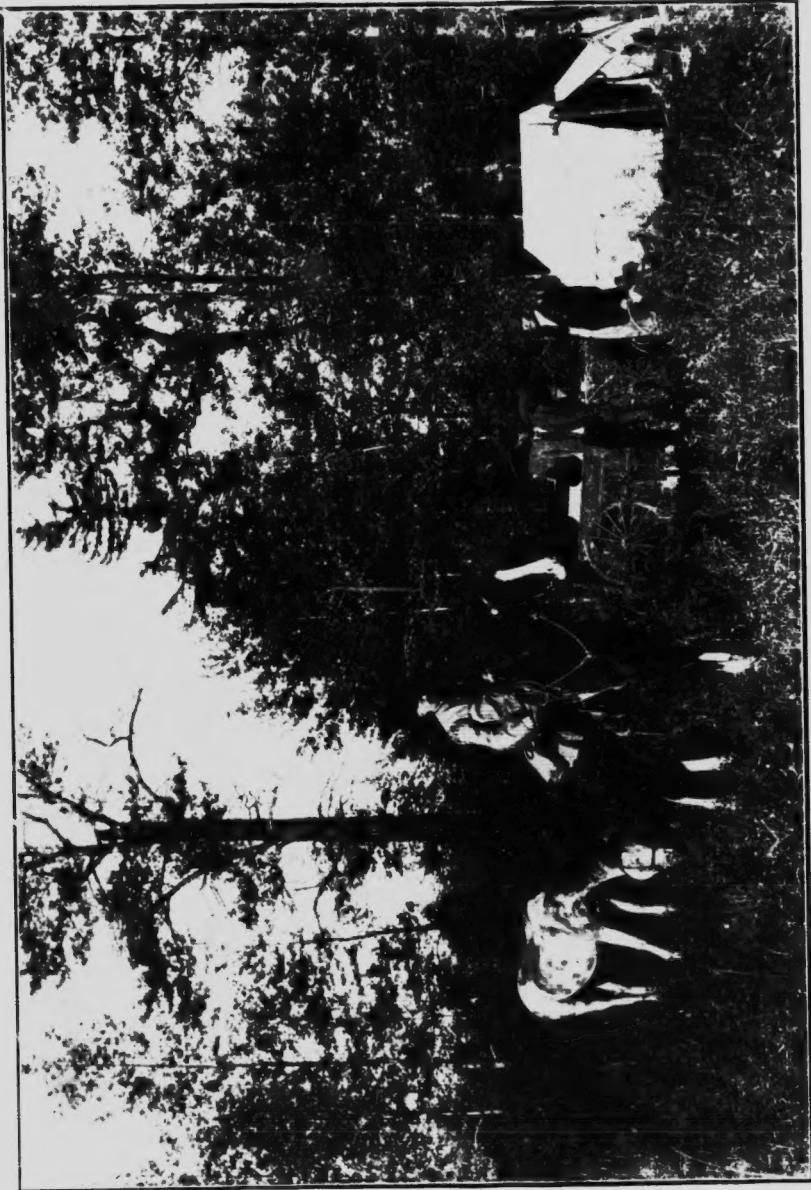


Photo by A. Knechtel

Forest Ranger Interviewing Campers, Cypress Hills Reserve, Alberta.



go out to the 100-acre farms, and to the numerous small villages and soon have a force of men to put it under control. But in the Northwest the population is scarce, railroads are not so numerous, and telephonic communication is not so good. In that country we cannot count much on putting out forest fires and so we have to be all the more diligent to see that fires do not get started.

The reserves are under constant patrol, summer and winter. During the danger periods the rangers lay aside all other duties and guard the forest against fire. In 1908, we had only two fires of any consequence, one in the Pines Reserve which burned over 22 square miles destroying no merchantable timber, and one in the Turtle Mountains, extending over 28 square miles, mostly covered with grass. In each of these fires, however, large areas of young reproduction growth was destroyed.

Last year we began a practice which we know saved the reserves several fires. It is a well known fact that, in the early spring, the fields become bare and the grass dry before the snow is all gone from the woods. While such conditions existed the forest rangers burned the meadows along the reserve boundaries. Fires, coming in from the prairie, met this wide fire line and died out for want of fuel. Around the Riding Mountains the meadows were burned for ninety miles, around the Duck Mountains for forty-two miles, and around the Porcupine Mountains for thirty miles, all these in the most dangerous places. It is the intention to extend this practice to all the reserves wherever it is practicable, and to carry it out upon an extensive scale.

Plowed fire guards also will be made around and across some of the reserves. The forest ranger on the Cypress Hills has instructions to plow a guard of four furrows entirely around the reserve, and outside of this four rods distant from it a second guard. Then, on calm days, with the help of two or three men he is to burn the grass between the two guards. On the Spruce Woods Reserve several guards will be plowed, one of which will run along each side of the Canadian Northern Railway which crosses the reserve.

Roads along the boundaries and through the reserves are being constructed to aid in fighting fire. One hundred and fifty miles was made this year. In certain places these roads are very much needed. For instance, I noticed in my inspection of the Turtle Mountain Reserve that the roads all run north and south. There is no way of going promptly and conveniently east and west. The fires mostly come in from Dakota which lies to the south. Therefore, to facilitate the fighting of fire the forest ranger was instructed to make a road follow-

ing the southern boundary. This will not only make it easier to move about on the reserve but it will serve as a fire line from which back-firing may be done.

REFORESTING.

The Department is making an attempt to reforest some of the areas denuded by fire. From some experiments made last spring, it would appear that this might be accomplishable by putting down a few seeds with a handful of sand over them at each place where we wish to have a forest tree. This was tried on the Turtle Mountains and on the Spruce Woods Reserve. In the former it was successful, in the latter unsuccessful. On the Turtle Mountains the seed was thus placed under poplars and among long grass. The following species were planted: White Pine, Norway Pine, Jack Pine, Bull Pine, White Spruce, Red Spruce, Colorado Blue Spruce, Engelmann Spruce and Balsam. Among the poplars the seed was evidently taken by birds, rodents or insects; but in the long grass every species germinated, and just before snow-fall the trees were alive and looking well.

It is intended to carry on a variety of such experiments next summer. For this purpose the forest ranger on the Spruce Woods Reserve collected last fall 40 bushels of Spruce cones, the ranger on the Cypress Hills 40 bushels of Lodgepole Pine, and a party of foresters working on the Pines Reserve 50 bushels of Jack Pine. These are the species with which we hope to achieve success as they are the ones likely to prove hardy.

We shall do our best to win along this line, because the method of raising trees in nurseries until they are three or four years old and then setting them out into the field is far too slow and too expensive a method to count much towards meeting the demand for wood that will develop on this continent during the next hundred years. The nursery method is simply gardening. It is a good method for the farmer's wood-lot. Foresters should, however, seek for a method commensurate to the needs of the Government lands. In the meantime, however, we are not despising the gardening method even on the reserves. We may be forced to use it, and next spring we shall start some seed beds. In fact 35,000 trees have already been planted on the Spruce Woods Reserve, from stock raised at the Forestry Farm at Indian Head.

REMOVAL OF SQUATTERS.

A large number of people, mostly foreigners, had located and started farming operations upon the reserves, expecting some time in some way, political or otherwise, they would be permitted to make entry for the places they occupied. The

go out to the 100-acre farms, and to the numerous small villages and soon have a force of men to put it under control. But in the Northwest the population is scarce, railroads are not so numerous, and telephonic communication is not so good. In that country we cannot count much on putting out forest fires and so we have to be all the more diligent to see that fires do not get started.

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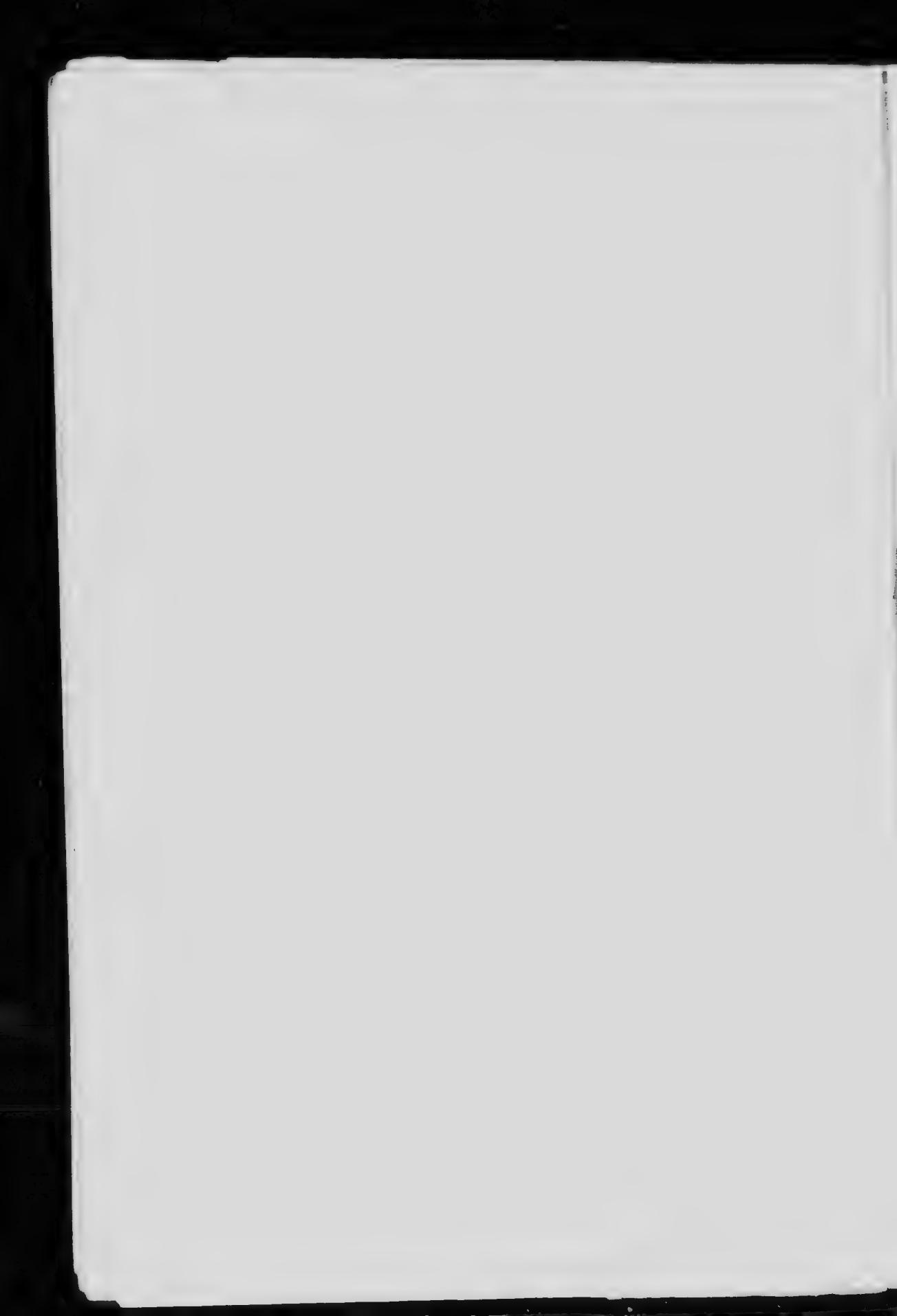
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White Spruce Seedling the Prairie, Sprucewoods Reserve, Manitoba.

[Photo by N. M. Ross]



Department determined upon their removal. They numbered one hundred and twenty-six on the Riding Mountain, and twenty-five on the Turtle Mountain Reserve. The task of removing these people was a delicate one and required great judgment and courage on the part of the forest rangers. The chief ranger of the Riding Mountains, W. A. Davis, devoted the entire summer to the work. All the squatters have been removed except three on the Riding Mountains and two on the Turtle Mountains. These remaining ones will move early next spring.

In this work the Department followed a lenient policy. The squatters were taken to look over lands in wagons furnished to them free of charge. They got free entry for the lands they selected, and they received compensation for improvements they had on the forest reserves. The total cost of removing all these people was only \$6,000. They have all made affidavits stating that they have been well treated and are pleased with the change.

MARKING RESERVE BOUNDARIES.

In order that the public may not unintentionally trespass upon the forest reserves thinking themselves on private property, or on other Dominion lands, the Department began last year to mark the boundaries with iron posts. These are three-cornered and hence differ in shape from the regular Dominion survey posts. They are marked with the letters "D. F. R." (Dominion Forest Reserve) and the part that projects out of the ground is painted red so that it will be readily observable, summer and winter.

Considerable work was done in this direction last year. Mr. David Beatty, a Dominion Land Surveyor, was at work with a party of men on the unsurveyed portion of the boundary of the Porcupine Reserve and ran fifty-one miles of the line. The forest rangers are working on the boundaries that have been surveyed and have located 140 miles.

This work was in many places difficult of accomplishment. It was about thirty years since the lines had been surveyed and some of them having been burned over, the wooden posts had been destroyed and the mounds almost obliterated. People familiar with the West know, also, that mosquitoes and flies are numerous and troublesome in the summer months. As it is the intention to have the boundary line a road from which fire can be fought it was cut out from six to eight feet wide.

Much more of this work would have been done if the rangers could have begun early in the spring. But during the early part of the summer they were all busy with the removal of squatters.

FOREST SURVEY.

In order that the Department may have a thorough knowledge of the reserves and become able to form judgment as to how the tree growth thereon should be managed, a timber and topographic survey is being conducted. Last summer Assistant Inspector MacMillan with a party of five forestry students conducted such survey of the Pines Reserve. Assistant Inspector Dickson did similar work with a party of thirteen in the Riding Mountains. It is the intention to have four such parties on the reserves next summer. This survey serves a double good purpose. It gives the Department the knowledge it desires and gives the students the practical side of their forestry course.

The timber survey makes a thorough study of the tree growth. It gives the areas covered with mature timber and with younger timber and states the quantity of each. It considers the accretion and the reproduction of timber in the forest and discovers means for their encouragement in quantity and quality. It examines areas having no tree growth, and recommends methods by which they may be afforested. It studies the effect of past management upon the forest, and advises improvements for the future. It suggests means by which dangers to the forest from fire, storms, fungi and insects may be reduced. It investigates the utilization of the forest, and seeks new uses for forest products.

The topographic survey describes the hills and valleys, the lakes, streams and trails. It studies the best routes for the removal of the mature timber and locates trails for protecting the forest against fire.

KINDS OF TIMBER.

The following species of trees exist in commercial quantity on the forest reserves:—

Poplar (*Populus tremuloides* Michx.) and Balm of Gilead (*Populus balsamifera* Linn.) exist on all reserves east of the Rockies. Poplar reaches a maximum size of 32 inches at breast height. Fifteen inches, however, is the largest common size for sound trees. Balm of Gilead reaches a maximum of 34 inches, with a common large size, sound, of 18 inches.

White Spruce (*Picea canadensis* [Mill.] B.S.P.) and Black Spruce (*Picea mariana* [Mill.] B.S.P.) exist on all reserves east of the Rockies except Turtle Mountain, Moose Mountain, Beaver Hills, Cooking Lake, Elk Island and Buffalo Park reserves. Maximum 48 inches; common large, sound, 18 inches.

Engelmann Spruce (*Picea engelmanni* Engelm.) exists on the Kootenay Lakes, Jasper Park, Rocky Mountain Park and

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Much more of this work would have been done if the rangers could have begun early in the spring. But during the early part of the summer they were all busy with the removal of squatters.

FOREST SURVEY.

In order that the Department may have a thorough knowledge of the reserves and become able to form judgment as to how the tree growth thereon should be managed, a timber and topographic survey is being conducted. Last summer Assistant Inspector MacMillan with a party of five forestry students conducted such survey of the Pines Reserve. Assistant Inspector Dickson did similar work with a party of thirteen in the Riding Mountains. It is the intention to have four such parties on the reserves next summer. This survey serves a double good purpose. It gives the Department the knowledge it desires and gives the students the practical side of their forestry course.

The timber survey makes a thorough study of the tree growth. It gives the areas covered with mature timber and with younger timber and states the quantity of each. It considers the accretion and the reproduction of timber in the forest and discovers means for their encouragement in quantity and quality. It examines areas having no tree growth, and recommends methods by which they may be afforested. It studies the effect of past management upon the forest, and advises improvements for the future. It suggests means by which dangers to the forest from fire, storms, fungi and insects may be reduced. It investigates the utilization of the forest, and seeks new uses for forest products.

The topographic survey describes the hills and valleys, the lakes, streams and trails. It studies the best routes for the removal of the mature timber and locates trails for protecting the forest against fire.

KINDS OF TIMBER.

The following species of trees exist in commercial quantity on the forest reserves:

Poplar (*Populus tremuloides* Michx.) and Balm of Gilead (*Populus balsamifera* Linn.) exist on all reserves east of the Rockies. Poplar reaches a maximum size of 32 inches at breast height. Fifteen inches, however, is the largest common size for sound trees. Balm of Gilead reaches a maximum of 34 inches, with a common large size, sound, of 18 inches.

White Spruce (*Picea canadensis* [Mill.] B.S.P.) and Black Spruce (*Picea mariana* [Mill.] B.S.P.) exist on all reserves east of the Rockies except Turtle Mountain, Moose Mountain, Beaver Hills, Cooking Lake, Elk Island and Buffalo Park reserves. Maximum 48 inches; common large, sound, 18 inches.

Engelmann Spruce (*Picea engelmanni* Engelm.) exists on the Kootenay Lakes, Jasper Park, Rocky Mountain Park and



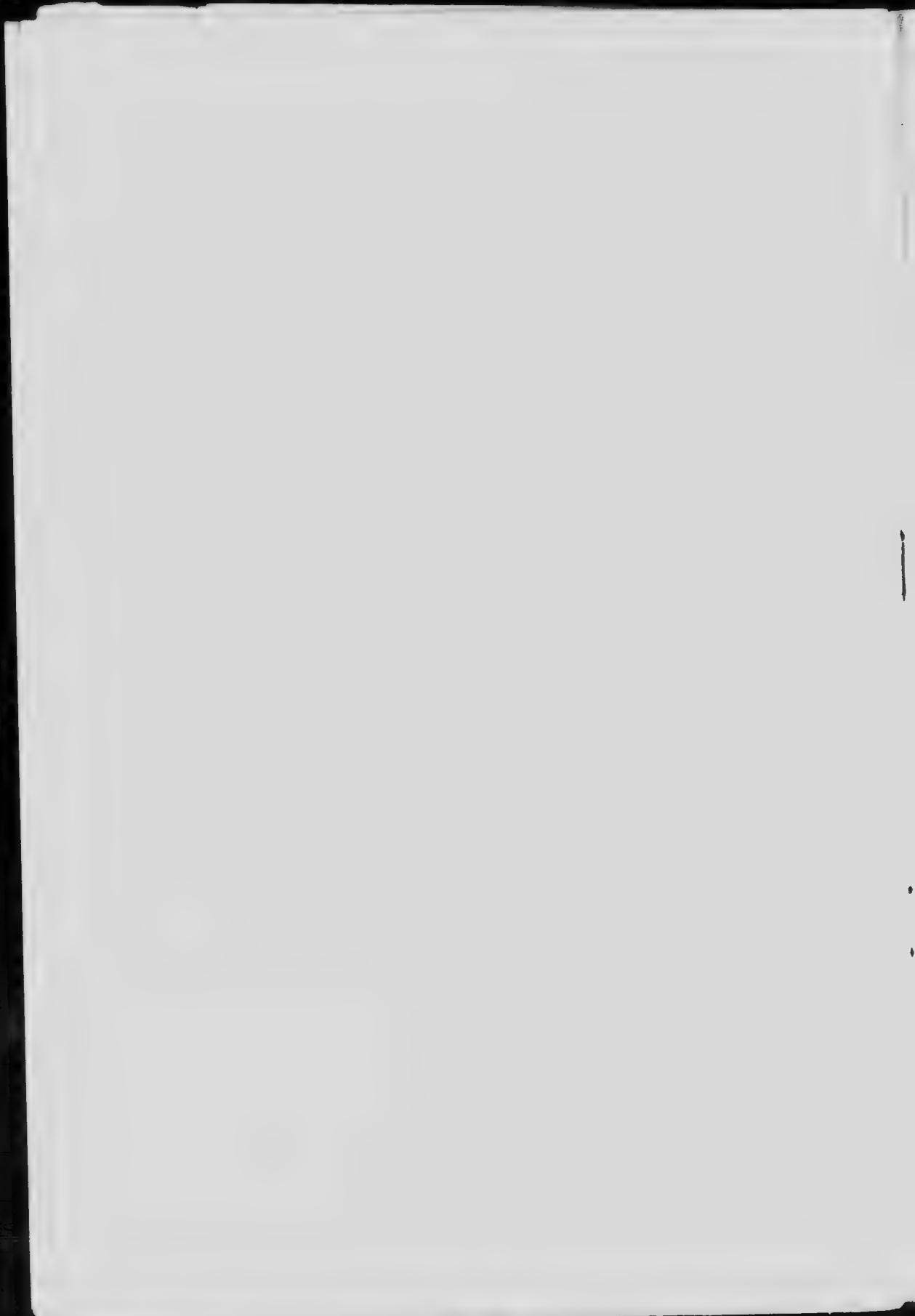
1968 - SW

Grazing Refugees Abandon Refugee Camps



1968 - SW

Food Survey Party - Summer 1968
Refugee Mountain Refugee Camps, Manitoba



all British Columbia reserves. Maximum 30 inches; common large, sound, 16 inches.

Jack Pine (*Pinus banksiana* Lamb.) exists on all Manitoba reserves except the Spruce Woods and Turtle Mountain. In Saskatchewan it appears in the Porcupine and the Pines reserves. Maximum 20 inches; common large, sound, 12 inches.

Lodgepole Pine (*Pinus contorta*, var. *Murryana* [Engelm.] B. & W.) exists on the Cypress Hills, Kootenay Lakes, Jasper Park, Rocky Mountain Park and all British Columbia reserves. Maximum 20 inches; common large, sound, 14 inches.

Bull Pine (*Pinus ponderosa* Laws.) exists on all British Columbia reserves. Maximum 36 inches; common large, sound, 26 inches.

Western White Pine (*Pinus monticola* Dougl.) exists on all British Columbia reserves. Maximum 32 inches; common large, sound, 24 inches.

Tamarack (*Larix americana* Michx.) exists on all the Manitoba reserves except Turtle Mountain. It occurs on the Pines and Porcupine reserves in Saskatchewan, and on the Jasper Park in Alberta. Maximum 24 inches; common large, sound, 14 inches.

Western Larch (*Larix occidentalis* Nutt.) exists on all the British Columbia reserves. Maximum 30 inches; common large, sound, 24 inches.

Douglas Fir (*Pseudotsuga mucronata* Sudw.) exists on the Kootenay Lakes, Jasper Park, Rocky Mountain Park and all British Columbia reserves. Maximum 36 inches; common large, sound, 24 inches.

Balsam (*Abies balsamea* [Linn.] Mill.) exists on Riding Mountain, Duck Mountain, Porcupine and Lake Manitoba West reserves. Maximum 17 inches; common large, sound, 10 inches.

Western Cedar (*Thuja plicata* Don.) exists on all British Columbia reserves. Maximum 84 inches; common large, sound, 40 inches.

Western Hemlock (*Tsuga mertensiana*, authors) exists on the British Columbia reserves. Maximum 35 inches; common large, sound, 10 inches.

White Birch (*Betula papyrifera* Marsh.) exists on the Manitoba reserves. Maximum 26 inches; common large, sound, 14 inches.

There are also on the Manitoba reserves small quantities of merchantable Green Ash (*Fraxinus lanceolata* Borkh.). Maximum 12 inches; common large, sound, 8 inches. Bur Oak (*Quercus macrocarpa* Michx.). Maximum 27 inches; common large, sound, 10 inches. Manitoba Maple (*Acer negundo* Linn.). Maximum 11 inches; common large, sound, 7 inches.

TIMBER ESTIMATES.

As has been previously stated, the Department is making a forest survey of the reserves which should give a close estimate of the timber thereon. Such estimate has been made for the Riding Mountain Turtle Mountain, Moose Mountain and the Pines reserves, and for these the following figures are probably close to the actual quantities on those reserves. For all other reserves the estimates are only tentative:—

MANITOBA RESERVES.

| | Saw Timber. | Fuel Wood. |
|-------------------------|---------------------|------------------|
| Duck Mountain..... | 300,000,000 bd. ft. | 3,000,000 cords. |
| Riding Mountain..... | 250,000,000 " | 2,500,000 " |
| Porcupine No. 1..... | 50,000,000 " | 750,000 " |
| Turtle Mountain..... | 1,333,000 " | 135,000 " |
| Spruce Woods..... | 1,000,000 " | 30,000 " |
| Lake Manitoba West..... | 600,000 " | 40,00 " " |
| Total..... | 602,933,000 " | 6,250,000 " |

SASKATCHEWAN RESERVES.

| | Saw Timber. | Fuel Wood. |
|----------------------|--------------------|----------------|
| Porcupine No. 2..... | 50,000,000 bd. ft. | 500,000 cords. |
| Moose Mountain..... | 5,000,000 " | 130,000 " |
| The Pines..... | . | 50,000 " |
| Beaver Hills..... | . | 10,000 " |
| Total..... | 55,000,000 " | 690,000 " |

ALBERTA RESERVES.

| | Saw Timber. | Fuel Wood. |
|------------------------|-----------------------|-------------------|
| Eastern Slope..... | 3,000,000,000 bd. ft. | 50,000,000 cords. |
| Rocky Mountain Park... | 300,000,000 " | 3,000,000 " |
| Jasper Park..... | 100,000,000 " | 1,000,000 " |
| Cypress Hills..... | 2,000,000 " | 100,000 " |
| Cooking Lake..... | . | 100,000 " |
| Kootenay Lakes..... | . | 10,000 " |
| Elk Island Park..... | . | 10,000 " |
| Total..... | 3,402,000,000 " | 54,220,000 " |

BRITISH COLUMBIA RESERVES.

| | Saw Timber. | Fuel Wood. |
|-------------------------|---------------------|-----------------|
| Railway Belt & Yoho Prk | 600,000,000 bd. ft. | 6,000,000 cords |



[Photo by J. F. Clark

Western Cedar and Black Pine,
Rocky Mountain Park Reserve, Alberta.

SUMMARY.

| | Saw Timber. | Fuel Wood. |
|------------------------|---------------------|------------------|
| Manitoba Res..... | 602,933,000 bd. ft. | 6,250,000 cords. |
| Saskatchewan Res..... | 55,000,000 " | 690,000 " |
| Alberta Res..... | 3,402,000,000 | 54,220,000 " |
| British Columbia Res.. | 600,000,000 | 6,000,000 " |
| Total..... | 4,659,933,000 " | 67,160,000 " |

ESTIMATE OF ANNUAL OUTPUT.

The following table showing the quantities and kinds of timber taken from the reserves is also tentative as it is only an estimate. Heretofore, the quantities of timber cut on permits granted for the reserves have not been kept separate in the records from those granted for timber on other Dominion lands. It is the intention that in future forest reserve matters shall be kept by themselves so that accurate data in regard to them can be obtained. The receipts, however, as stated in the table, may be considered as correct. The figures may seem small considering the quantities of timber removed; but it should be borne in mind that every homesteader is entitled to one free permit.

TIMBER CUT DURING YEAR ENDING MARCH 31ST, 1908.

| DISTRICT. | Lumber. Ft. B.M. | Logs. Lineal ft. | Cordwood. Cords. | Fence Posts. No. | Fence Rails. No. | Poles. No. | Receipts |
|--|---------------------|---------------------|---------------------|------------------------|------------------------|---------------|-------------|
| Manitoba Reserves..... | 3,780,180 | 17,134 | 3,647 | 31,100 | 22,650 | 8,250 | \$ 7,044.41 |
| Saskatchewan Reserves | 343,435 | 464,110 | 9,029 | 117,140 | 106,510 | 102,414 | 535.35 |
| Alberta Reserves..... | 1,400 | 332,612 | 1,280 | 52,080 | 247,155 | 48,265 | 56.75 |
| British Columbia Reserves..... | 8,338,000 | | 2,500 | | | | 4,794.00 |
| Eastern slope, North as far as Brazeau River..... | 31,551,610 | | 56,037 | 336,860 | 1,336,700 | | 19,325.00 |
| Totals..... | 44,123,625 | 813,856 | 72,493 | 537,180 | 1,713,015 | 158,929 | \$31,755.51 |

Throwing these different kinds of material into saw timber and cordwood we have saw timber about 45,751,325 board feet; cordwood 105,943 cords. Dividing these quantities into the quantities estimated as standing on the reserves and we perceive that the saw timber should last for one hundred years, and the cordwood for six hundred and thirty-four years, practically forever, providing that the rate of consumption remains the same and that no timber be destroyed by fires or other causes. To be sure the growth has not been taken into account, but it is reasonable to suppose that fires will at least offset the growth, be we ever so vigilant.

THE REMOVAL OF TIMBER.

The cutting of timber on the forest reserves is under the control of the Superintendent of Forestry. In the Moose Mountain, Turtle Mountain, Spruce Woods and Cypress Hills Reserves no wood except dry or fallen timber is allowed to be cut. On these reserves there is no mature timber and the restriction is necessary to save the young trees which would otherwise be cut as soon as they would become usable. On all other reserves both dry and green timber may be cut.

Permits to cut dry wood up to twenty-five cords are granted free of dues, only a small office fee of twenty-five cents being required as on all permits. Permits are granted to cut dry wood for sale or barter up to one hundred cords at the rate of twenty-five cents a cord.

A homesteader is allowed one free permit and only one, to cut either dry or green timber if he has no timber suitable for his purposes on his own place. A free permit may be issued for the following quantities:—

(a) 3,000 lineal feet of building timber, no log to be over 12 inches in diameter at the butt end, unless the timber is cut from dry trees, in which case timber of any diameter may be taken. If the building timber is to be sawn at the mill the permittee is entitled to receive free of dues enough timber for 9,250 feet of lumber, and no more.

(b) 400 roof poles to be used for such purpose.

(c) 500 fence posts, 7 feet long, and not to exceed 5 inches at the small end.

(d) 2,000 fence rails.

In Manitoba, Saskatchewan, or Alberta, a settler who loses his dwelling or other building by fire not due to his own carelessness, is entitled to a free permit for timber to replace it. The quantity, however, must not exceed the amounts stated above.

Any bona fide settler who has not a sufficient supply on his own farm may be granted each year a permit for the following quantities of timber at the prices here stated:—

10,000 feet board measure of building logs for lumber, no tree to be cut which is of less diameter than ten inches at breast height, or at four and one-half feet from the ground:

Poplar..... @ \$1.50 per thousand feet.

Other Species..... @ 3.00 "

500 fence posts, seven feet long, not to exceed five inches in diameter at the top:

Poplar and Willow..... @ 2c. each.

Other Species..... @ 5c. "

500 fence rails or roof poles, not to exceed six inches in diameter at the butt:

Poplar only..... @ 2c. each.
1,000 lineal feet of round building material, no log to exceed twelve inches in diameter at the butt.

Any Species..... @ 1c. per lineal ft.
15 cords of fuel:

Poplar only..... @ \$1.00 per cord.

Timber cut without permit in the reserves is seized by the forest rangers, and double dues are charged upon it. If the dues are not paid the timber is disposed of at public auction. If no bid is received equal to the amount due the Government the wood may be disposed of by private sale. During 1908 the rangers seized 190,626 feet, board measure, 900 fence posts and 16 loads of cordwood, and collected as dues \$1,101.61 with some seizures still unsettled.

Up to the present time permits have been granted only to actual settlers living within fifty miles of the nearest boundary of any reserve. This limitation is under consideration. There is very little wood in southern Manitoba and scarcely any in Saskatchewan, and it is a question if the people all over these provinces should not be allowed the use of the mature wood of the forest reserves. It may not be quite justice to allow only the people living in the immediate vicinity of the reserves to have all the blessings.

It is a question also, if it is wise to allow only settlers to cut the timber. The average settler in taking out timber has little care for the future of the forest. His only object is to get out the timber he needs as easily as possible. If one tree has all the timber he requires, but if two will furnish it more easily, he will cut the two trees. Moreover, the settlers cut high stumps leave large tops, and make no disposal of the brush. Millmen, knowing the loss in cutting high stumps and leaving large tops, and having regard for the future growth, treat the forest with much greater care. It therefore seems to me that mills should be permitted to enter the reserves, but they should enter under certain restrictions:—

- (1) Only portable mills should be permitted.
- (2) Mills should locate where the Forestry Branch directs.
- (3) Permits should be granted for a definite tract not more than one mile square.
- (4) Permits should be granted for one year only, but should be renewable at the discretion of the Superintendent of Forestry and should be cancellable at any time for violation of the regulations.
- (5) Only such timber should be cut as is marked previously by the Department for removal, and no cutting should begin before the marking is completed.

- (6) In cutting down the trees the stumps left should not be more than 18 inches high.
- (7) The trees should be cut down with a saw.
- (8) All parts exceeding 4 inches in diameter of trees cut down should be removed by the permittee, and this should be done as the cutting progresses.
- (9) Brush should be cut so as to lie flat on the ground excepting along the roads where it should be piled and burned under the immediate supervision of the Department.
- (10) Any unmarked trees cut down on account of the lodging of the larger trees in felling should be piled by themselves separately from the other logs, and should be considered the property of the Department to be afterwards disposed of, either to the permittee or others as considered best.
- (11) The dues on timber removed should be the same as those demanded of settlers.
- (12) Lumber should be sold only to bona fide occupants of homesteads, or for the purpose of erecting churches and schools in rural districts.
- (13) Any lumber obtained from a permittee and afterwards sold or offered for sale should be seized by the Department.
- (14) No settler should be permitted to receive from the mill in any one year more than 10,000 feet of lumber.
- (15) The price of lumber at the mill should be fixed periodically by the Department.
- (16) Settlers should be permitted to draw out their lumber with their own teams.
- (17) Permittees should be required to keep a mill book in which should be recorded all sales, to whom made, quantity sold, and price charged.

The Department has this scheme of treating the forest already under operation. A sawmill operating in the Cypress Hills was last fall put under such restrictions, partly as an experiment, and I am glad to be able to report that the experiment is apparently a success. The owner of this mill had applied for a tract of spruce timber three-fourths of a mile square. The Department stated the restrictions. They were accepted. Assistant Inspector Dickson marked the trees to be cut, and the work of cutting began. The forest ranger of the Cypress Hills Reserve, who has the work under his supervision, writing on January 22, 1909, reports as follows: "I have been down to the Grayburn mill for a few days and was all through the bush where they are cutting. They are keeping very close to the marked trees. I told them to get the brush piled along the trails and to

get the poles out and they promised to do so. I will go down again soon and burn it."

THE RESERVES AS PLEASURE RESORTS.

There are many beautiful lakes on the forest reserves and some of these are being now freely used as summer resorts. It seems to me that this should be encouraged. The campers are not a menace to the forest, in fact they are a protection, as they have personal interest in guarding the forest against fire. Besides, with campers on the lakes when a fire occurs there are people at hand to help to extinguish it. Therefore, the Department has under consideration the advisability of renting camp sites on the shores of these lakes, the leases to be made out for ten years, renewable at the discretion of the Superintendent of Forestry and cancellable at any time for any misuse or menace to the forest reserve.